



# *Emmitsburg* **Comprehensive Sustainable Plan**



# Why Green?

Only 1 Earth

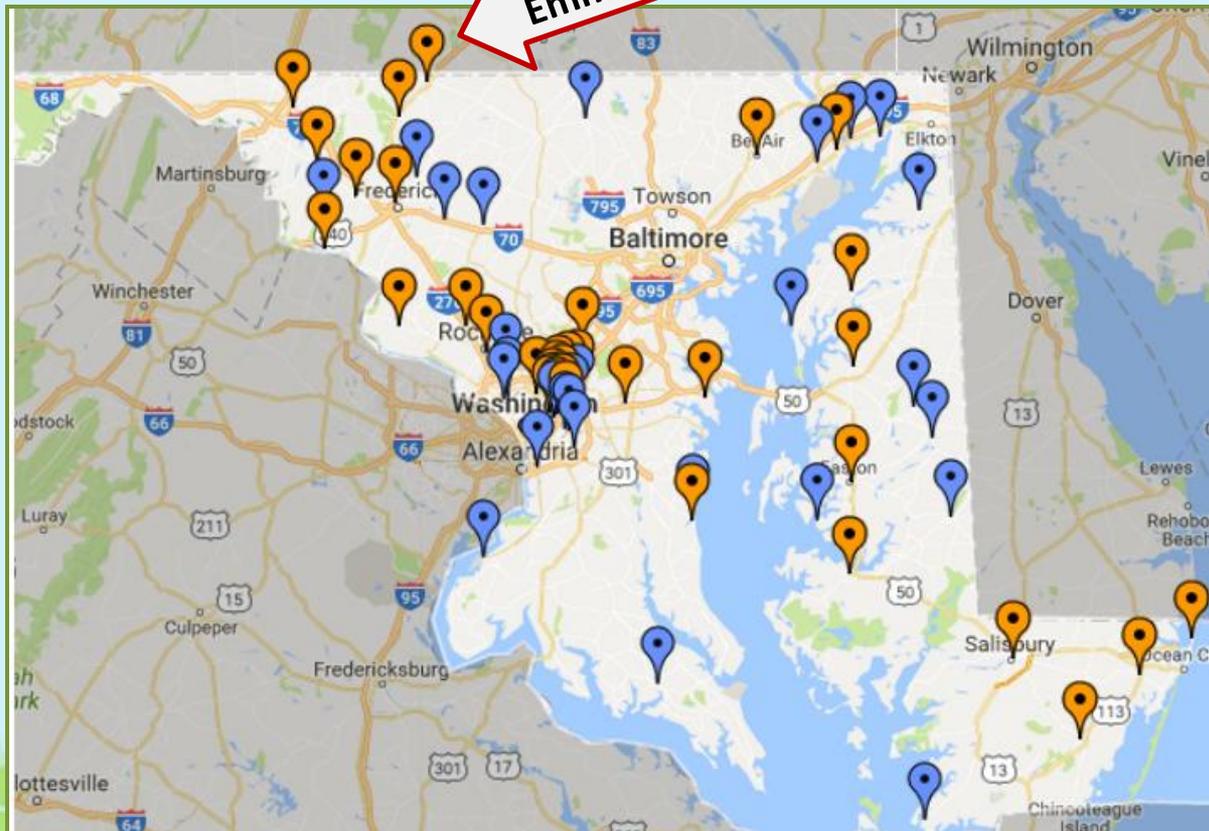


# Sustainable Maryland

Certified: October 27, 2015

Vote: 5 – 0 in Favor

Emmitsburg



## Benefits:

- Grant Priority
- Free Training & Tools
- Improved Efficiency
- Town Promotion
- Expert Guidance
- Conserve Resources

**67** Total Participating

**35** Currently Certified

Registered



Certified



# The Green Team

**\*Mandatory\***

Green Team: A group of people (community leaders, town staff, and organizations) that gather monthly to lead and coordinate sustainability activities in the community.

## Current Members:

Mayor Briggs, Madeline Shaw, Barbara Weedon, Charlotte Mazaleski, Libby Briggs, and Michael Cantor.



# Completed Sustainable MD Projects



Community Garden Beds  
\$20 Refundable Deposit



Farmers Market  
Every Friday  
June 23<sup>rd</sup>- September 22<sup>nd</sup>  
3pm – 6pm

# Ongoing Sustainable MD Projects



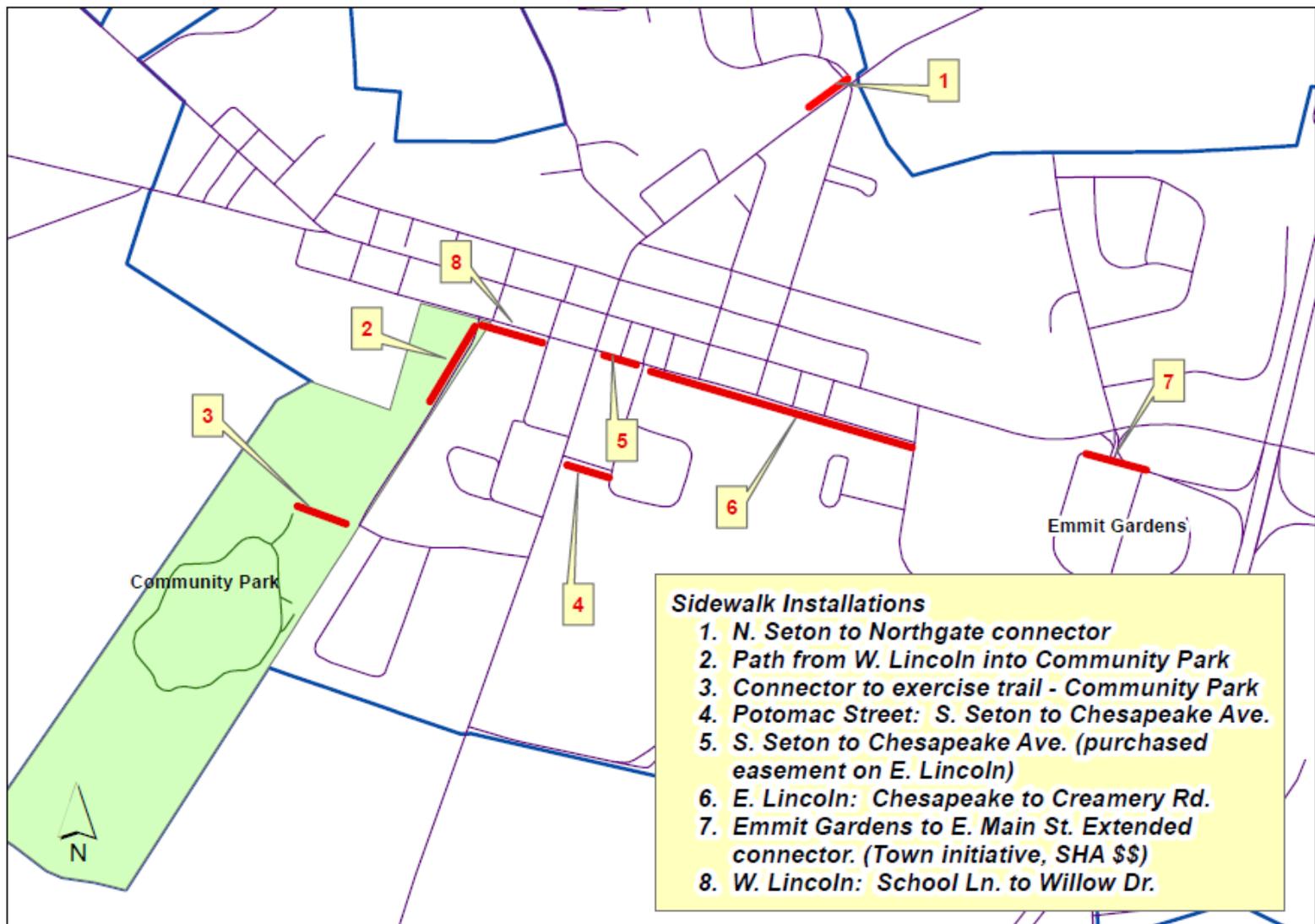
Mountain Bike Trails

Thanks Commissioner O'Donnell!



Dog Park

# Let's Move- Sidewalk Installations



Map Created Using GIS Software

# Completed Sustainable MD Projects

- Pet Waste Ordinance (6.04.140)
- Emmitsburg Business & Professional Association
- Solar Fields (Phase 1 & 2)



Solar Fields



LED Lights

# DHCD Grant Participation:

Emmitsburg Community Legacy

**Total Grant  
Funds Received:**  
**\$250,000**



**DHCD**

Maryland Department of Housing  
and Community Development

# Community Legacy Projects

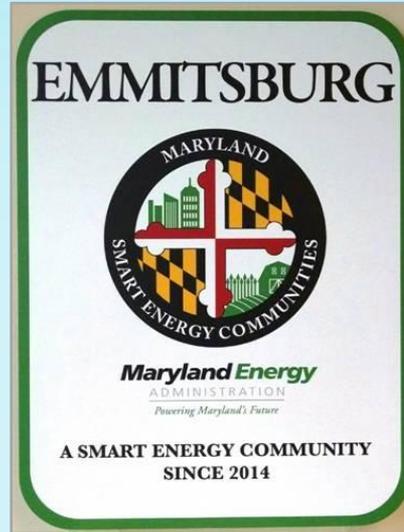
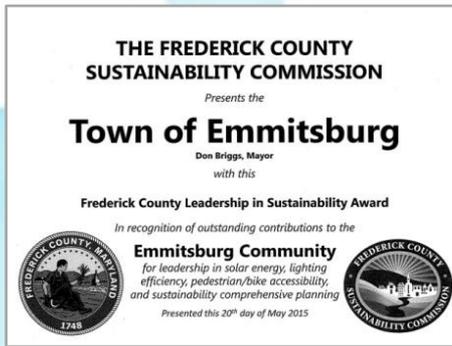
Before



After



# Emmitsburg Sustainable Awards



“The solar project was very forward thinking...good thinking using renewables for both industrial processes and building energy. I am convinced that we must all take the leap to more efficient, less polluting forms of energy as our gift to future generations. I really think we have no choice. I am also happy to see how you tied economic development to sustainability- it's a win-win.”

-Shannon Moore-

Manager, Office of Sustainability and Environmental Resources

March 1, 2017

# Goal of the Town

To reduce conventional energy use by 20% by 2022  
using renewable energy

**Policy 2013-02** (Electrical Energy Efficiency Policy)

**5 – 0 in Favor**

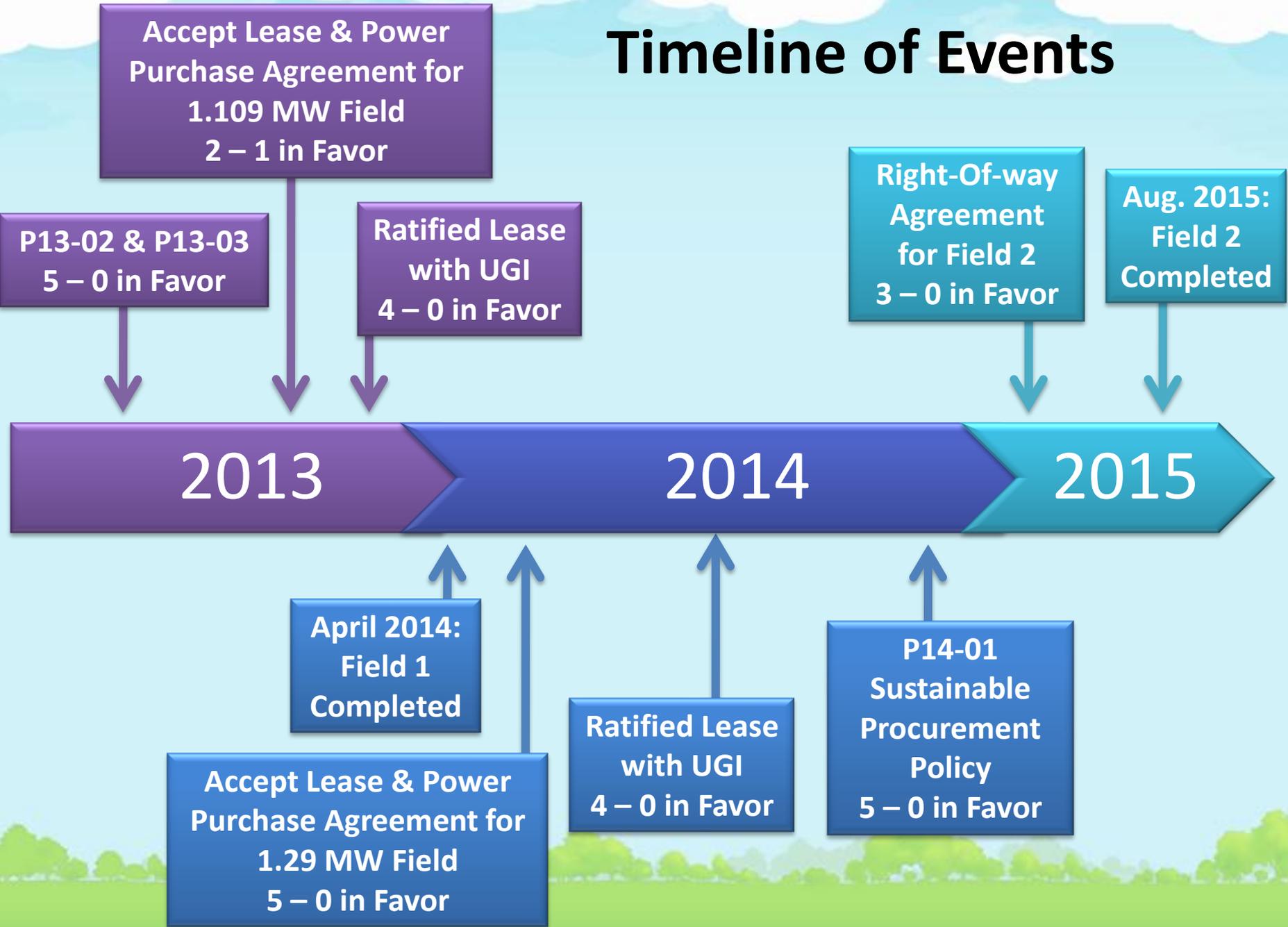
August 19, 2013

**Policy 2013-03** (Alternative Energy Policy)

**5 – 0 in Favor**

August 19, 2013

# Timeline of Events



# Electricity measurements

$$1,000 \text{ W} = 1 \text{ kW}$$

$$1,000,000 \text{ W} = 1,000 \text{ kW} = 1 \text{ MW}$$

*kilowatt-hour (kWh)*: is 1,000 watts delivered in a hour. Typically used for energy billing.

*megawatt-hour (MWh)*: is 1,000 kilowatts delivered in an hour. Typically used to describe energy delivered by a power plant.

# LED Street Lights

- The LED bulbs used over 60% less Kilo Watt hours than the regular bulbs.
- The Town's electrical cost for street lights was reduced by 40% compared to the cost in 2011.
- The LED bulbs cut the Towns overall electrical use by roughly 9%.

Fiscal Year	Annual Cost	Difference	% Change vs. 2011
2011	\$51,228	---	---
2012	\$47,231	\$3,997	8%
2013	\$42,795	\$8,433	16%
2014	\$30,533	\$20,695	40%

# PowerStar

## Calculations and Savings Summary

<b>Minimum Voltage 119.8</b>	<b>Maximum Voltage 124.1</b>	<b>Average Voltage 122.0</b>
POWERSTAR 150 kVA System will reduce site voltage by 10V		
<b>Annual Savings</b>		
Previous Annual Consumption	191,424 kWh	
Anticipated Annual Percentage Savings	10.3%	
Annual kWh Savings	19,717	
Tons of CO2 Reduced	1007	
Annual Savings (\$)	\$2,059.00	
Total Investment	\$17,587.00	
Warranty	10 Years	

# **Executive Summary- Pump Station and Water Treatment Plant**

## **100% Guaranteed Savings \***

The percentage of kWh figure that is presented in this proposal is 100% guaranteed.

If you do not achieve the full guaranteed saving percentage laid out in this proposal we will provide a one-off payment to compensate for the difference between the actual savings achieved and the guaranteed savings promised.

## **10 Year Warranty \***

Our warranty includes parts and labor for the period.

## **5 Year Buy Back Option \***

We understand that sites do change over time, therefore if you replace your existing Powerstar system with a larger Powerstar system within 5 years of purchase we will credit you the cost of the smaller Powerstar unit.

\* See Terms and Conditions for full details.

# Solar Powered Algae Control System

## Water Savings:

- 642,250 gal/month

## Chemicals Reduced:

- Coagulant (-20%)
- Soda Ash (-20%)
- Chlorine (-10%)
- Green Clean (No Longer Needed)



# Algae Control System: Water Savings

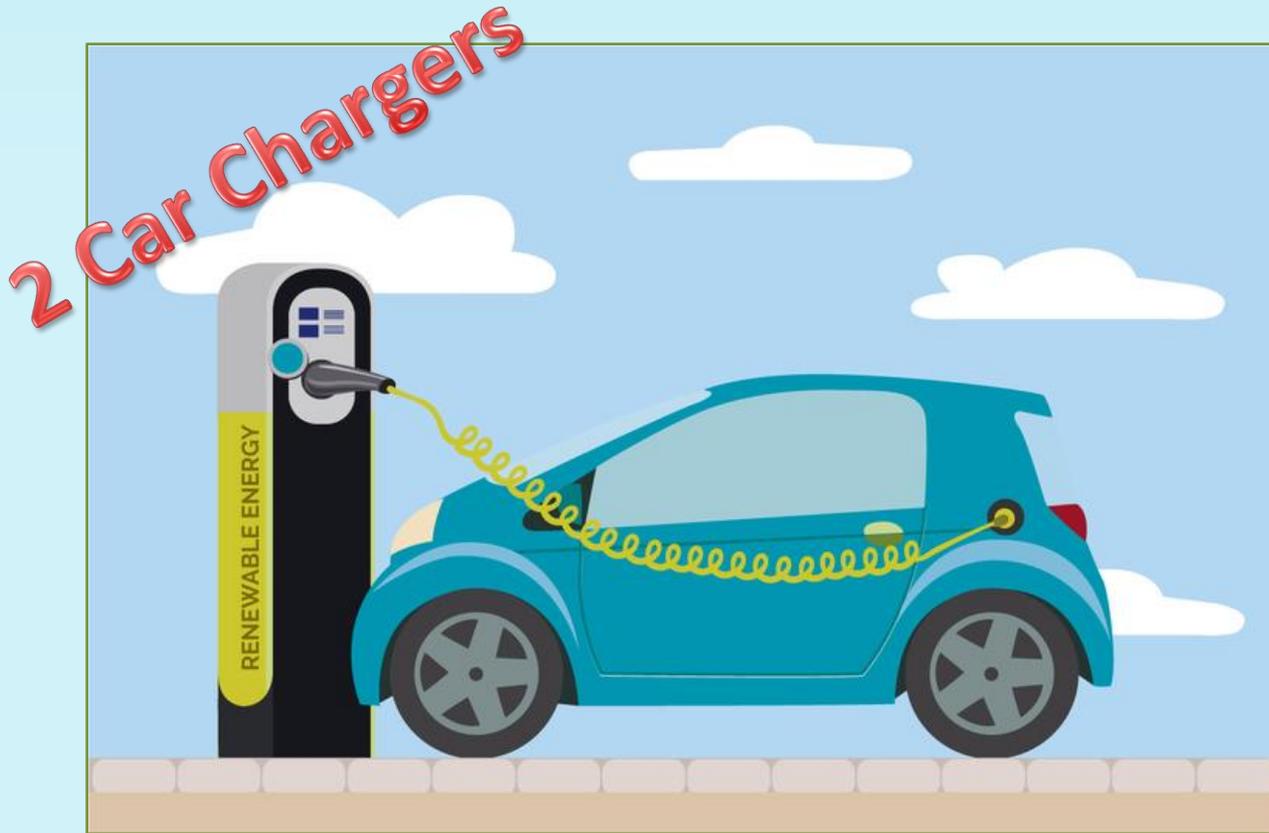
$$\frac{642,250 \text{ gal}}{30.5 \text{ days}} = 21,468 \text{ gal/day}$$

$$\frac{21,468 \text{ gal/day}}{250 \text{ gal/day per household}}$$

**= 85 Taps We  
Could Save!**

Residential State  
Requirement

# Future: Electric Car Chargers



The Metropolitan Washington Council of Governments submitted a grant application to the VW settlement for two EV chargers for Emmitsburg.

# Why Were the Fields Built?

- Bay Restoration: MDE new legislation for water leading to the bay. The legislation requires reduction in nitrogen (4 mg/L) and phosphorus (0.3mg/L) levels in WWTPs.
- Future: The new WWTP is operating at about 65% capacity
- Locked Energy Rates: 20 years at 2% increase





# Town Energy Expenses

# Town Energy Expense

	A	B	C	Total
<b>FY</b>	<b>Potomac Edison Expense</b>	<b>UGI Solar kWh Expense</b>	<b>**First Energy kWh Refund</b>	<b>FY Energy Cost (A + B – C)</b>
<b>10</b>	175,400			\$175,400
<b>11</b>	164,300			\$164,300
<b>12</b>	146,800			\$146,800
<b>13</b>	126,400			\$126,400
<b>14</b>	128,500			\$128,500
<b>15</b>	63,700	143,300	<b>(70,200)</b>	\$136,800
<b>16</b>	68,000	228,200	<b>(94,100)</b>	\$202,100
<b>*17</b>	26,100	116,900	<b>(69,400)</b>	\$73,600

\* FY17 thru December 2016

\*\*Actual Refund & YE Accruals

# Fiscal Year vs. Solar Generation Year

Fiscal Year = July thru June (*Audited*)

Solar Generation Year = May thru April



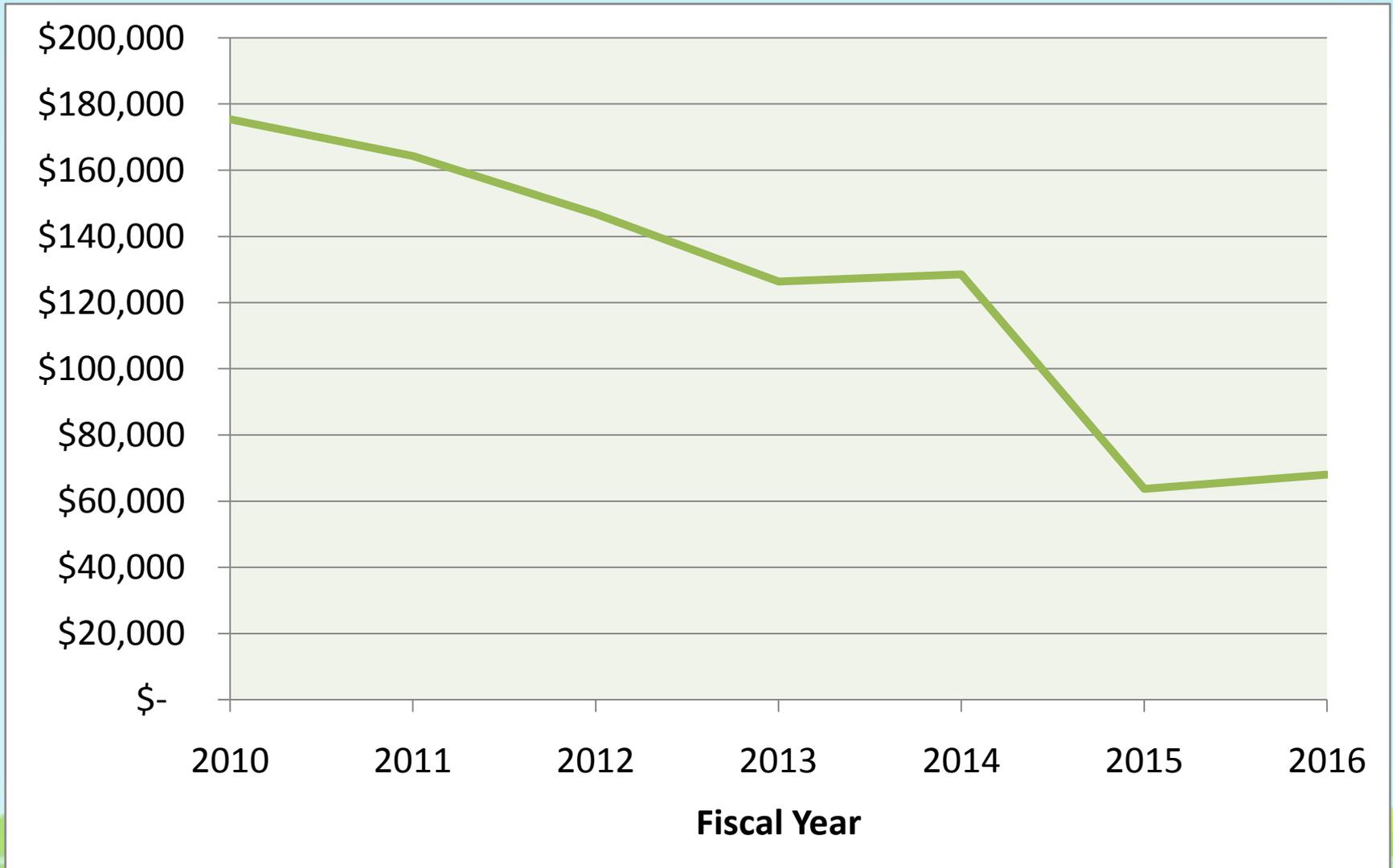
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\* FY17 thru December 2016

\*\*Actual Refund & YE Accruals

# Potomac Edison Expenses



# Potomac Edison Highlights

- ✓ Starting FY15 invoices down 50% from prior year
- ✓ kWh usage with variable rates no longer applies
- ✓ kWh rates fixed to assist in budgeting
- ✓ Certain line item charges no longer apply to Town

# Town Energy Expense

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\* FY17 thru December 2016

\*\*Actual Refund & YE Accruals

# Solar Field 1

- Opened April 2014
- Initial UGI rate per kWh = \$0.079
- Avg monthly production = 124,700 kWh since opening



# Solar Field 2

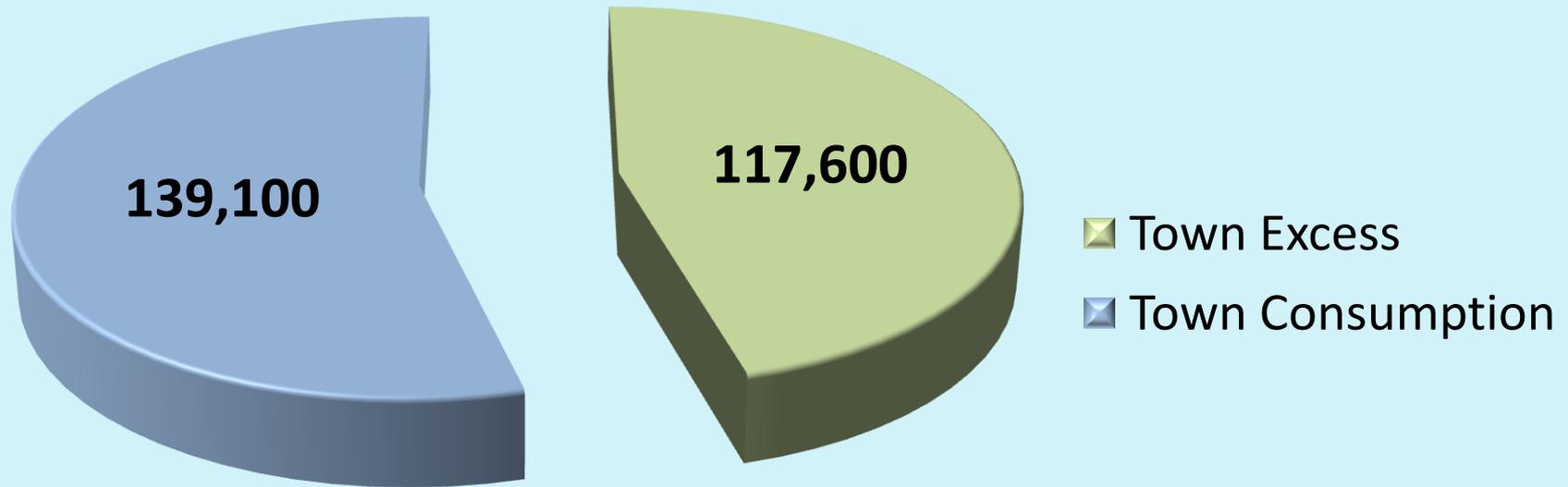
- Opened August 2015
- Initial UGI rate per kWh = \$0.068
- Avg monthly production = 129,600 kWh since opening



# Solar Fields 1 & 2

## Average Monthly kWh Generation

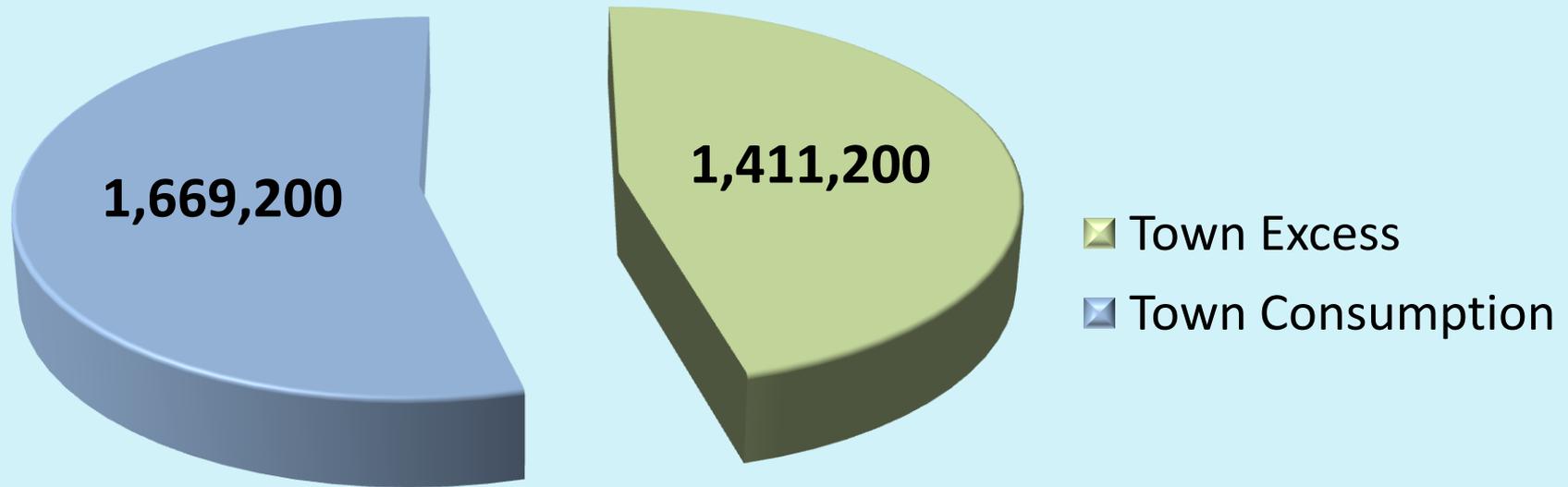
*Note: Since August 2015*



**Average Monthly Generation: 256,700 kWh**

# Solar Fields 1 & 2

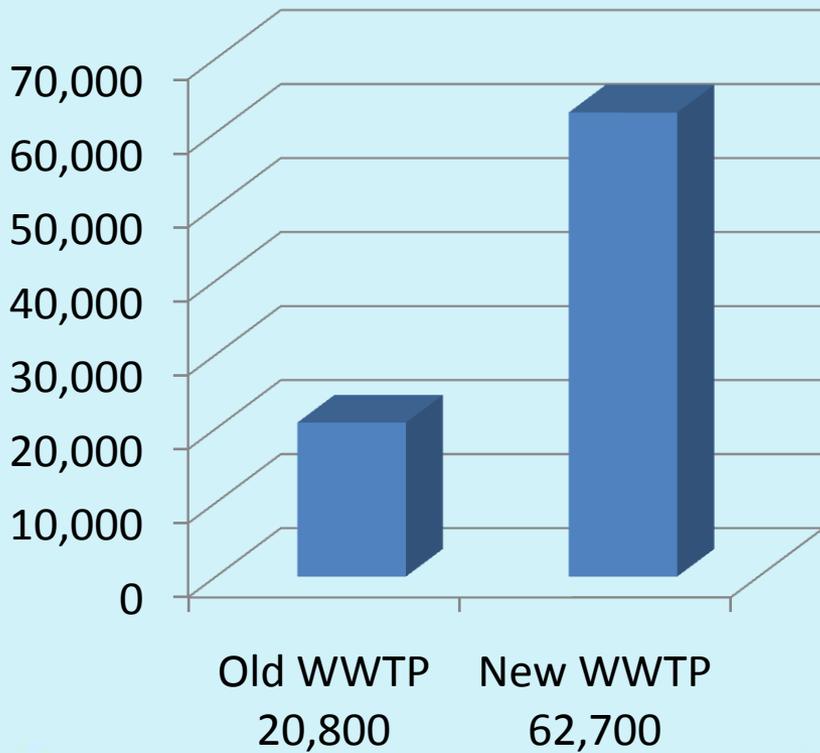
## Projected Yearly kWh Generation



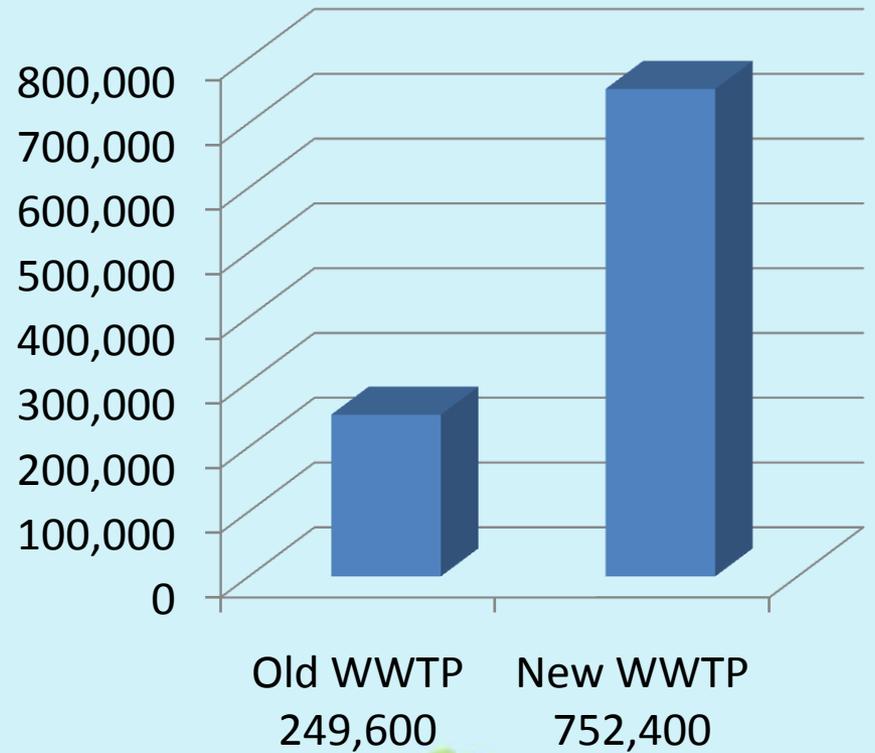
**Projected Yearly Generation: 3,080,400 kWh**

# WWTP Energy Consumption

## Average Monthly kWh



## Projected Yearly kWh



*Note: Since Aug 2015*

# Solar Fields 1 & 2

- Both Fields Energy Generation: 250,000 kWh/mo
- The new/old WWTP uses about 80,000 kWh/mo
- On average the plants use 32% of the solar generation



# Solar Fields 1 & 2

- Both Fields Energy Generation: 3,000,000 kWh/yr
- The new/old WWTP uses about 960,000 kWh/yr
- On average the plants use 32% of the solar generation



# Town Energy Expense

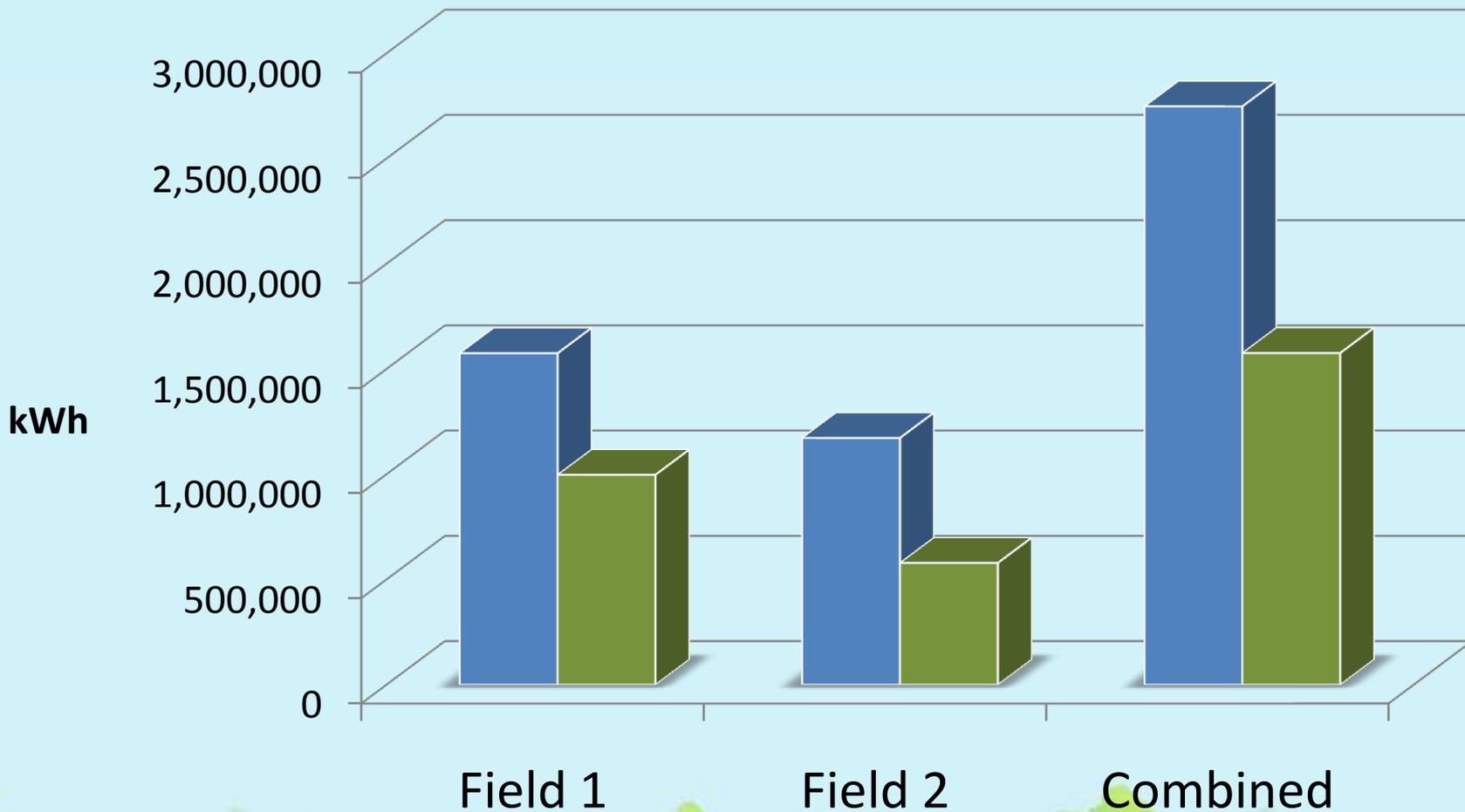
	A	B	C	Total
FY	Potomac Edison Expense	UGI Solar kWh Expense	**First Energy kWh Refund	FY Energy Cost (A + B – C)
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14	128,500			\$128,500
15	63,700	143,300	(70,200)	\$136,800
16	68,000	228,200	(94,100)	\$202,100
*17	26,100	116,900	(69,400)	\$73,600

\* FY17 thru December 2016

\*\*Actual Refund & YE Accruals

# Town Consumption

May 2015 – April 2016



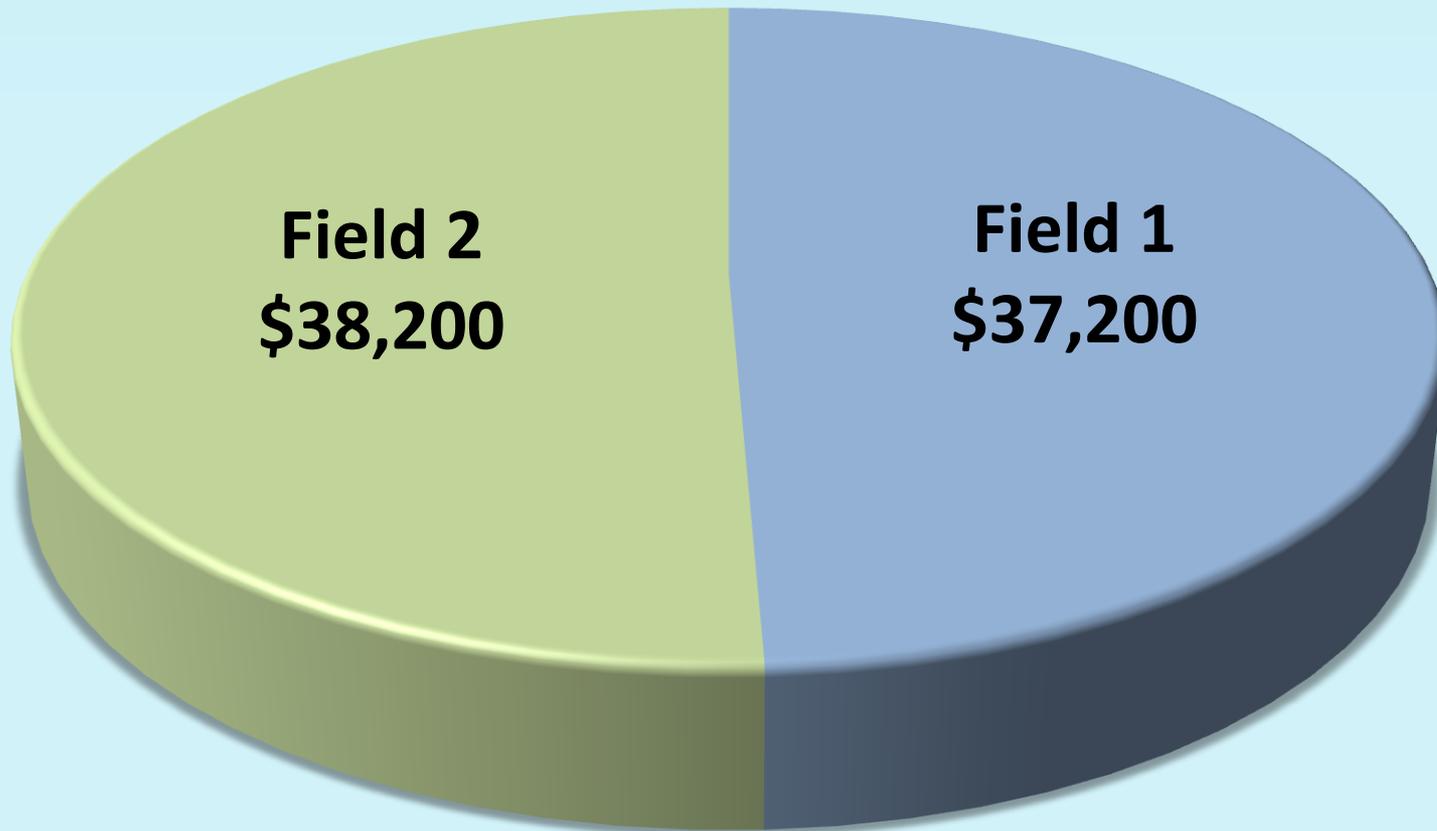
*Note:*

*Field 1: May 2015 to Apr 2016*

*Field 2: Aug 2015 to Apr 2016*

■ UGI Generation ■ Town Consumption

# First Energy Refund – FY16



**Total: \$75,400**

*Note:*  
.06435 per  
kWh excess

# Excess Generation Analysis

May 2015 – April 2016

		A	B	(A-B)
Solar Field	Town kWh Excess	Excess UGI kWh Expense	Excess 1st Energy kWh Refund	Town Excess Net Expense
1	577,700	\$46,900	(\$37,200)	\$9,700
2	594,000	\$40,400	(\$38,200)	\$2,200
Total	1,171,700	\$87,300	(\$75,400)	\$11,900

*\*Solar Field 2 only 9 month period (August 15 – April 16)*

# *Projected First Energy Refund – FY17*

3,080,400 ←

Projected UGI Generation (kWh)

-1,669,200 ←

Projected Town Consumption (kWh)

1,411,200 kWh

Total: \$90,800

# Projected Net Generation Expense

	A		B	(A - B)
Avg Monthly UGI Expense since Aug 2015	Projected Yearly UGI Expense	Projected Excess Non Consumed	Projected Yearly First Energy Refund	Projected Net kWh Expense
\$19,500	\$234,000	1,411,200 kWh	(\$90,800)	\$143,200



Our Projected Solar Generation Cost for FY 2017

# Solar Field 1

**Passed:** December 2013

**Completed:** April 2014

**Accounts:** 20 Town Accounts

Initial UGI kWh Rate:	Current UGI kWh Rate:	National Consumer Price Index Avg	Bureau of Labor Statistics Balt-Wash Avg
0.079	0.08384	> 0.13	0.128

# Solar Field 2

**Passed:** October 2014

**Completed:** August 2015

**Accounts:** WWTP Account

Initial UGI kWh Rate:	Current UGI kWh Rate:	National Consumer Price Index Avg	Bureau of Labor Statistics Balt-Wash Avg
0.068	0.06936	> 0.13	0.128

# FY10 Base Year – Yearly 2% Increase Analysis

	A	B	(A-B)
FY	Town Energy Expense	Yearly 2% Increase	Town Energy Savings
<b>10</b>	\$175,400	\$175,400	Base Year
<b>11</b>	164,300	178,908	(\$14,608)
<b>12</b>	146,800	182,486	(\$35,686)
<b>13</b>	126,400	186,136	(\$59,736)
<b>14</b>	128,500	189,859	(\$61,359)
<b>15</b>	136,800	193,656	(\$56,856)
<b>16</b>	202,100	197,529	\$4,571
<b>17*</b>	73,600	100,740	*( \$27,140)

Note: \*FY17 thru December 2016

# Summary

Projected FY 2017 energy expense is less than our total energy expense of \$175,400 in 2010

*before* the \$19 million WWTP came online.

In addition to reduced expenses, we now have the capacity to grow.

# Community Account Array

New community account array will allow us the opportunity to add specific non-town organizational users to reduce the amount of excess kilo watt hours.



# Our Impact



# Green Impact of *Our* Fields

Emmitsburg Has **Avoided**  
5,655,000 Lbs Carbon Dioxide (CO<sub>2</sub>)  
Since Solar Installation!



*Note: Numbers according to Standard Solar as of 04/03/2017 @ 12:30pm*

# Green Impact of *Our* Fields

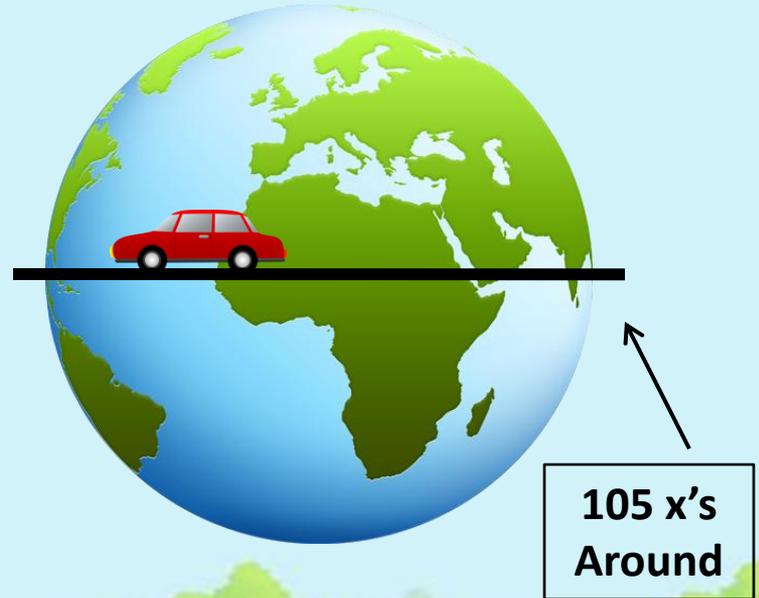
**Gasoline Tanker  
Trucks Avoided:**

74,540



**Miles Driven In a  
Family Sedan:**

2,624,000



*Note: Numbers according to Standard Solar as of 04/03/2017 @ 12:30pm*

# Green Impact of *Our* Fields

**Barrels of Oil Avoided:**

2,625

**Trees Saved:**

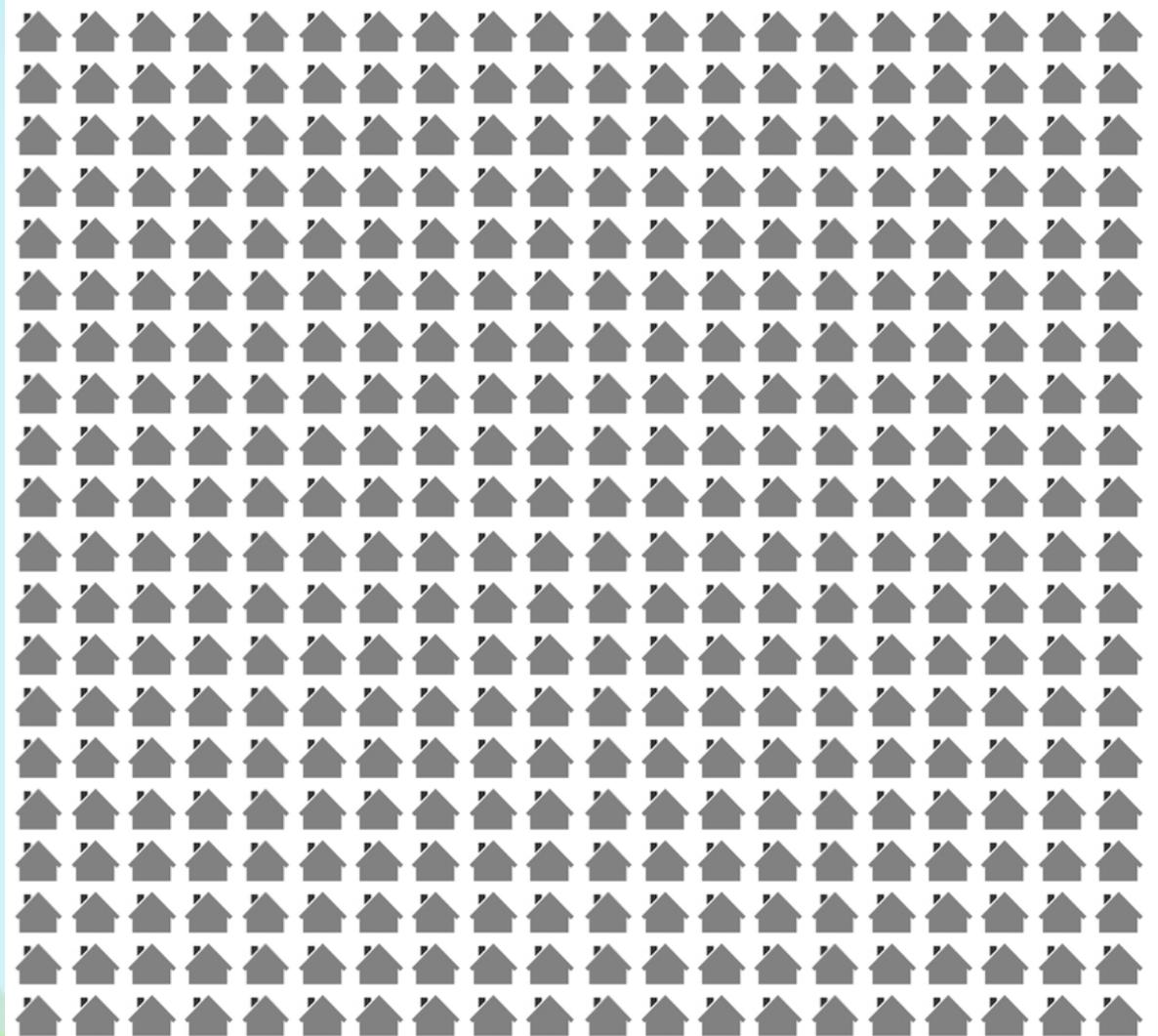
117,817



*Note: Numbers according to Standard Solar as of 04/03/2017 @ 12:30pm*

# Green Impact of *Our* Fields

Homes Powered  
for One Year:  
404



*Note: Numbers according to Standard Solar as of 04/03/2017 @ 12:30pm*

# Future Sustainable Projects

- Rain Barrels and Composting Programs
- “Adopt a Street” Program
- Watershed Stewardship
- Water Conservation Plan
- Tree Planting



The Town of Emmitsburg recognizes its responsibility to minimize negative impacts on human health and the environment while supporting a diverse, equitable, and vibrant community and economy. The Town recognizes that the types of products and services the Town buys have inherent social, human health, environmental and economic impacts, and that the Town should make procurement decisions that embody the Town's commitment to sustainability.

*Policy 2014-01*